



# Noise

## Mitigation Monitoring Report

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Report prepared for TAVCO by the City of  
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## Hot Button Issues!



Most compliant airline this month:

**United Airlines!**

p. 7



Small freight jet airline gets most notices of deviations from Phoenix, p. 7



Noise Complaints are up, most complaints received during any month so far this year, p.8



The Sky Harbor airport conducts noise briefings with FAA controllers, p.9.

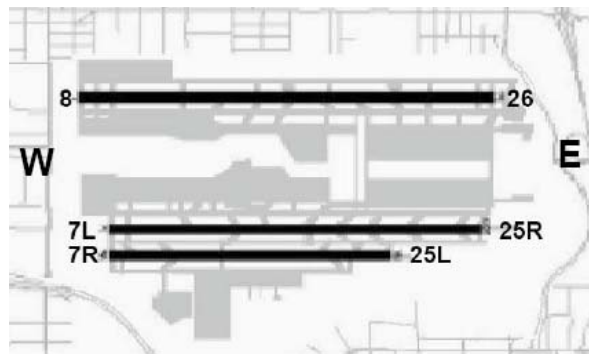


TAVCO's recommendations followed up in City's response to the Sky Harbor DEIS, p. 9

## 1. Introduction

This report is assembled for the Tempe Aviation Commission (TAVCO) to monitor the monthly compliance of operations at Phoenix Sky Harbor International Airport with certain noise mitigation flight procedures over the City of Tempe. TAVCO consists of 13 Tempe residents appointed by the Tempe Mayor with approval of the City Council to assist and advice on aviation noise and other issues relating to the Phoenix Sky Harbor International Airport. The

City of Tempe is located directly east of the Phoenix Sky Harbor International Airport. The airport has 3 parallel runways and is owned and operated by the City of Phoenix.



### The IGA on Noise Mitigation Flight Procedures

In 1994 the City of Phoenix and the City of Tempe agreed to continue noise mitigation flight procedures already in use over Tempe:

- Have jets and large aircraft depart to the east over the Salt River;
- Equalize the noise burden from jets and large aircraft departures between east and west during daytime and nighttime hours on an annual basis.

The agreement also introduced a new procedure for mitigation noise from arriving aircraft:

- Make use of a side-step maneuver to land jets and large aircraft on the new third runway (25L) from the east. The City of Tempe had prior to the agreement challenged the plans for the construction of a third runway because of inadequate assessment of the environmental impacts, and agreed to settle the legal challenge in exchange for an Intergovernmental Agreement (IGA) on noise mitigation flight procedures with the City of Phoenix<sup>1</sup>.

### The Phoenix Sky Harbor International Airport part 150 Noise Compatibility Study

The City of Phoenix also agreed to submit an update to the F.A.R. Part 150 Noise Compatibility Plan and Program for the Phoenix Sky Harbor International Airport to the FAA no later than start of operation on the new 3<sup>rd</sup> runway. The completed update of September 2000 was sent to the FAA for approval after being approved by the Phoenix Advisory Aviation Board and the Phoenix City Council. Prior to updating the elements of the plan, the FAA had reviewed new noise exposure contour map forecasts that the City of Phoenix had completed in March of 2000. The FAA announced that it had received the September 2000 study in March 2001, and approved it in October of 2001 with effective date September 7, 2001. Inaugural flights from the 3<sup>rd</sup> runway started October 5, 2000, after which the airport closed the runway temporarily to complete installation of runway lights. A few weeks later the 3<sup>rd</sup> runway was in regular use. The September 2000 update included the following recommendations on noise mitigation flight procedures to the east:

- Continue the runway use program calling for the equalization of departure operations to the east and west both daytime and nighttime.
- Continue the 4 DME departure route procedure which overflies the Salt River by all jets and large propeller aircraft departing Runways 8 and 7L
- Implement the 4 DME departure route procedure for all jets and large propeller aircraft departing Runway 7R.
- Establish a side-step approach to Runway 25L for noise abatement.

The study also recommended directing (smaller) propeller aircraft departing Runway 7R to turn to a 120 degree heading upon reaching the end of the runway to concentrate traffic over commercial/industrial corridor of Interstate 10 southeast of the airport.

<sup>1</sup> Maricopa Recorder: 9/28/1994, reference number 94-0706551

## The 4-DME procedure

### The 1993 Environmental Impact Statement (EIS)

According to the 1993 EIS, which among other planned improvements included the construction of a third runway, departures to the east from the new runway would follow the so-called "One-DME" Standard Instrument Departure procedure (SID) similar to the SID already in use by aircraft departing to the east from the airport<sup>2</sup>.



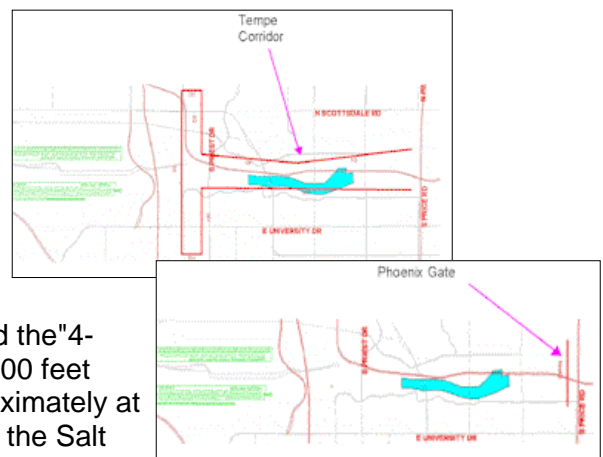
North Runway 8L (Now 8): "Fly heading 085° to intercept PHX-075, across PXR R-350 at or below 3,000'. At 4 DME east of PHX VORTAC, turn right/left"  
 Center Runway 8R (Now 7L): "Fly direct PHX VORTAC, cross PHR at or below 3,000'. Proceed via PHX R-075 to 4 DME east, turn right/left" (FAA SW-1 of August 10, 2000)

### The 1994 Record of Decision

The continued use of the "One-DME procedure" was also stated in the Record of Decision (ROD) for the final EIS, where the FAA approved the 1989 master plan update that included the plans for a third runway. When Phoenix and Tempe signed the Intergovernmental Agreement (IGA) on noise mitigation flight procedures over Tempe, the FAA reaffirmed its commitment to uphold these procedures<sup>3</sup>. The "One-DME procedure" became the "4-DME procedure" when a navigational aid (VORTAC) was moved closer to the airport.

### Measure for Departure Procedure Compliance

Based on the 4-DME Standard Instrument Departure procedure (SID) TAVCO proposed a corridor over the river bed of the Salt River to measure how jet aircraft and large turboprop aircraft<sup>4</sup> complied with the "4-DME procedure" using the Noise and Flight Track Monitoring System that Phoenix had agreed to install. This proposal was adopted by the Tempe City Council, but was rejected by the City of Phoenix. The airport use a vertical line to measure compliance of jet departures called the "4-DME Gate" or the "Exit Window Only Gate", which is a 5,500 feet long imaginary line running north south at 4-DME or approximately at Price Road. Turns by carrier jets north or south away from the Salt riverbed before reaching this line, or failures to stay inside the north or south end of this line are registered and in a compiled format submitted to the airlines in a "Notice of Deviation" letter from the airport administration. Deviations influenced by local weather conditions are excluded from the notification procedure.



<sup>2</sup> Source: Final Environmental Impact Statement Phoenix Sky Harbor International Airport Master Plan Update Improvements, November 1993, Section 5.

<sup>3</sup> The FAA made an amendment dated September 13, 1994 to the original ROD of January 18, 2004, where it reaffirmed its commitment to noise mitigation measures described on page 15 in the original ROD.

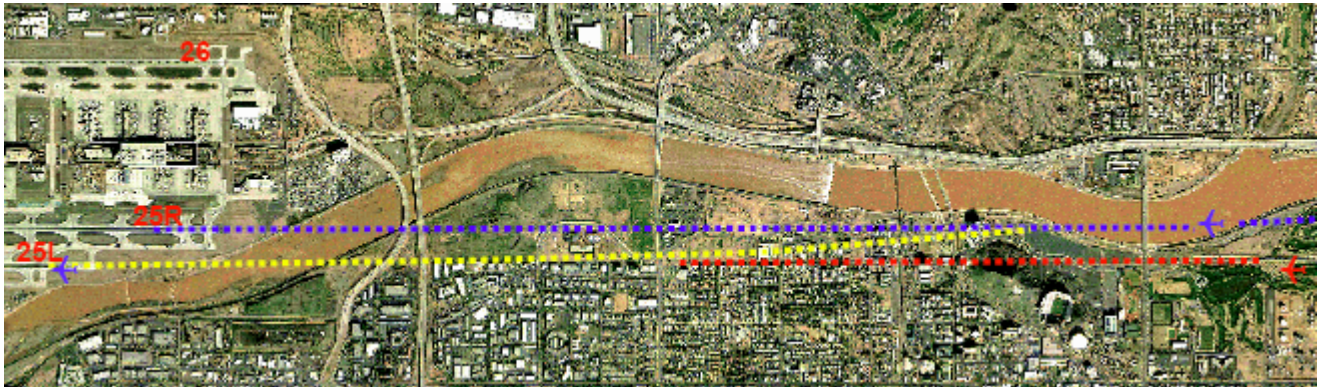
<sup>4</sup> Aircraft certified and operated according to Title 14 FAR Part 121 or 135 with gross weight exceeding 12,500 pounds



This report compares departure compliance using the Tempe Corridor and the Phoenix "4-DME Gate" or "Exit Window Only Gate", and for the Tempe Corridor measure includes large turboprop aircraft because they are part of the 1994 agreement. Since the implementation of the "4-DME Gate" deviation standard for large carriers in 1997, the main issue of concern has been how well these aircraft on departure from Phoenix Sky Harbor International Airport to the east keep to the Salt riverbed and avoid flying over populated areas in Tempe.

### The "Side Step" procedure

This is a noise mitigating procedure for jets and large turboprop aircraft that approach Phoenix Sky Harbor International Airport from the east to land on the third runway, Runway 25L.



Aircraft are directed to approach the center runway, Runway 25R, until they are 3 NM from the runway end or abeam Sun Devil Stadium at Mill Avenue in Tempe. At this point the pilot can be requested by the Phoenix air traffic controllers to change the approach course to land on Runway 25L. When the pilot directs the aircraft from a stabilized approach to the Runway 25R towards the left and line up for landing on Runway 25L, the pilot performs a "side step procedure". This procedure is designed to keep large aircraft approaches over the river bed as long as possible before they close in towards neighborhoods in downtown Tempe south of the riverbed.

On March 27, 2002 the FAA suspended implementation of a charted "side step" procedure because of flight safety concerns. Presently the FAA is clearing jets and large turboprop aircraft for straight-in approaches to Runway 25L from the east. No measure has been set up in the airport Noise and Flight Track Monitoring System to monitor the use of this procedure, and in its present format this report does not include any data on the utilization of the "side step" procedure.

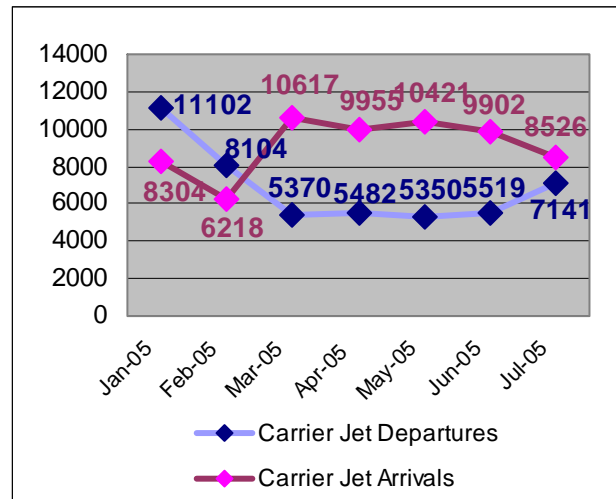
### The Departure Split (Equalization)

This procedure attempts to disperse evenly on an annual basis the noise impact of eastbound and westbound jet and large turboprop aircraft departures between Tempe and Phoenix during day and nighttime hours.

## 2. Aircraft Operations

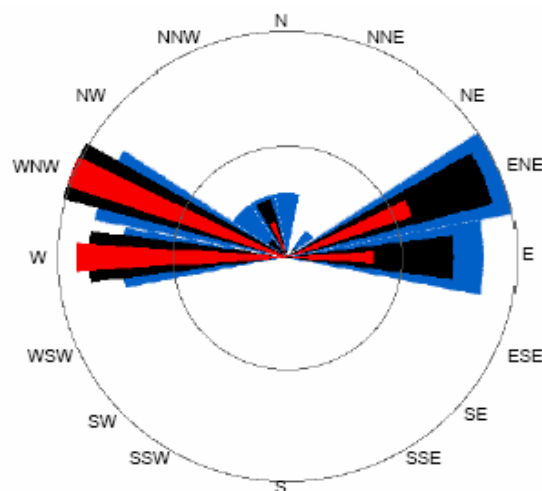
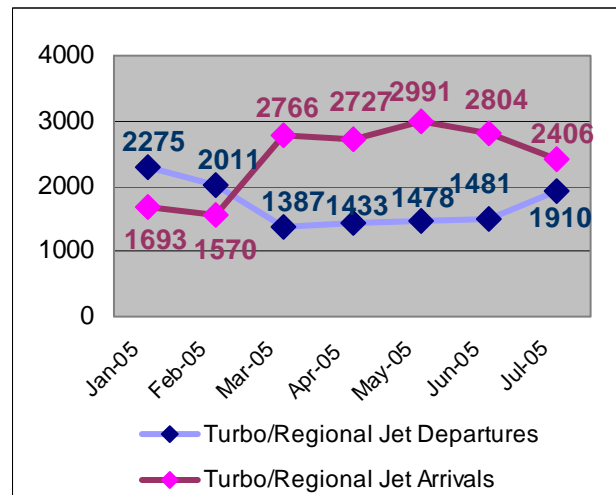
### Carrier Aircraft

The number of large carrier jets departing to the east during the month of July 2005 increased 29.4% compared to June 2005. Carrier arrival operations from the east towards the west decreased 13.9% compared to operations in June 2005.



### Regional Jets & Large Turboprop Aircraft

Regional jets and large turboprop departures towards the east increased 29.0% in July 2005 compared to June 2005. The number of regional jets and large turboprop aircraft arriving from the east decreased by 14.2% compared to the previous month.



For each of the sectors the outermost (blue) wedges show the wind frequency distribution.

The middle (black) wedges show the distribution of the product of the two columns, i.e. the wind speeds times their frequency.

The innermost (red) wedges show the distribution of the wind speeds cubed (i.e. the energies) multiplied by their frequencies.

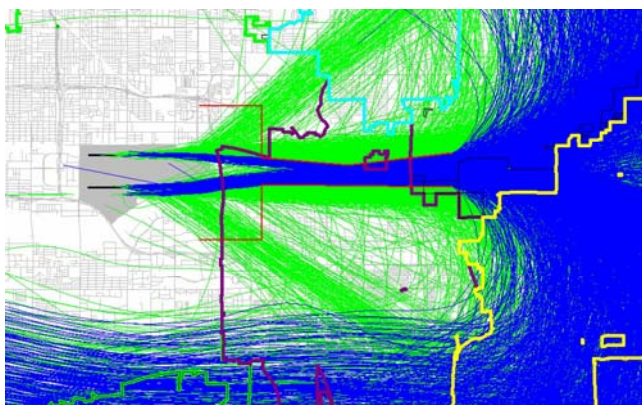
Of all jet and large turboprop departures to the east, 275 departures or 2.9% occurred between 0:00 and 6:00 a.m. 165 or 1.5% of all jet and large turboprop arrivals from the east occurred between these early hours.

Moderate winds mainly from the northwest, west and northeast with speeds up to moderate breeze, 13.5 knots, during one evening hour at 6:00 p.m.

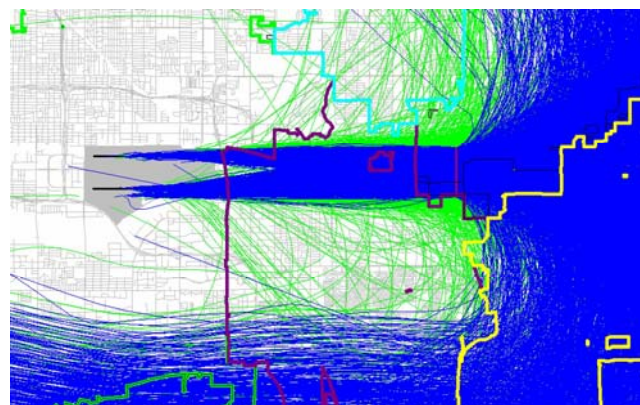
### 3. Departure Compliance

#### Compliance Rates

Including the large turboprop aircraft, which routinely are routed on approximate departure angles of 120° towards the southeast and 60° towards the northeast, **64.8%** of all jet and larger turboprop aircraft departures to the east complied with the Tempe Corridor during the month of July 2005. 96.9% of the jets complied with the Phoenix 4 DME gate. Departures by large turboprop aircraft are not included in the Phoenix gate compliance rate.



Flight tracks inside the Tempe Corridor are depicted in blue.



Flight tracks inside the Phoenix Gate are depicted in blue.

Carrier	ICAO Code	%	Carrier	ICAO Code	%	Carrier	ICAO Code	%
American Airlines	AAL	71.4	Continental	COA	60.0	Midwest Express	MEP	46.7
Airborne Express	ABX	68.8	Custom Air Transport	CTT	87.5	GA	N	32.7
Air Canada	ACA	100.0	Casino Express	CXP	50.0	Northwest Airlines	NWA	45.7
Ameristar Jet Charter	AJI	100.0	Delta Airlines	DAL	18.5	Flight Options	OPT	50.0
Ameriflight	AMF	0.0	DHL Airways	DHL	60.0	Pace Airlines	PCE	33.3
			US. Department of Justice	DOJ	0.0	Sun Country Airlines	SCX	69.2
American Trans Air	AMT	81.3	Executive Jet Aviation	EJA	48.3	Sky West	SKW	68.8
Aero Mexico	AMX	35.3	Federal Express	FDX	60.6	Southwest Airlines	SWA	68.9
Alaska Airlines	ASA	63.6	Frontier Airlines	FFT	41.4	Swift Air	SWQ	17.4
Mesa Airlines	ASH	58.8	Citation Chares	FIV	58.3	TAG Aviation	TAG	0.0
America West	AWE	73.6	Hawaiian Airlines	HAL	50.0	Sunset Aviation	TWY	100.0
British Airways	BAW	33.3	JetBlue	JBU	40.0	United Airlines	UAL	83.2
Continental Express	BTA	68.6	Kalitta	KFS	0.0	United Parcel Service	UPS	45.3
Atlantic Southeast	CAA	37.5	Kitty Hawk Air Cargo	KHA	57.1	US Airways	USA	43.4
Capital Cargo International	CCI	66.7	Flexjet	LXJ	20.0	US Check Airlines	USC	42.9
Champion Air	CCP	100.0						

#### Departures excluded<sup>5</sup>

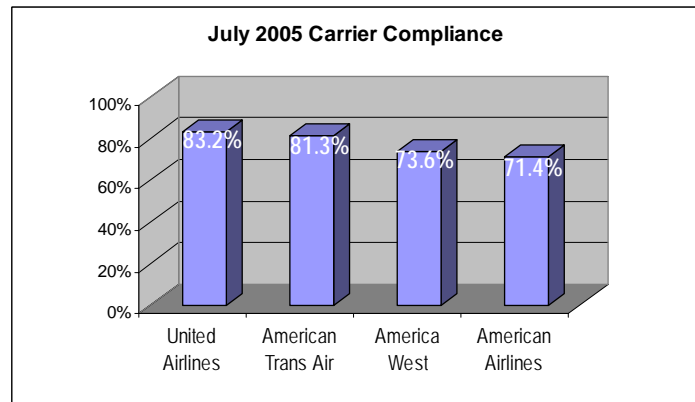
7/1 2005 9:09-10:05 a.m.	7/17 2005 10:08-11:28 p.m.	7/27 2005 1:00-1:50 p.m.
7/3 2005 9:16-10:37 a.m.	7/18 2005 11:02-11:53 p.m.	7/27 2005 7:35-10:15 p.m.
7/4 2005 7:02-8:04 a.m.	7/22 2005 8:34-11:14 a.m.	7/29 2005 8:15-8:25 a.m.
7/8 2005 7:17-8:06 a.m.	7/22 2005 7:56-11:03 p.m.	7/29 2005 6:22-7:41 p.m.
7/9 2005 9:20-9:59 a.m.	7/23 2005 7:24-9:57 p.m.	7/30 2005 5:07-6:45 p.m.
7/13 2005 8:02-8:55 p.m.	7/24 2005 6:35-7:08 a.m.	7/31 2005 5:06-9:17 p.m.
7/13 2005 9:13-10:42 p.m.	7/26 2005 5:06-6:39 p.m.	

<sup>5</sup> Based on City of Phoenix evaluations of weather influencing navigation east to 4DME.

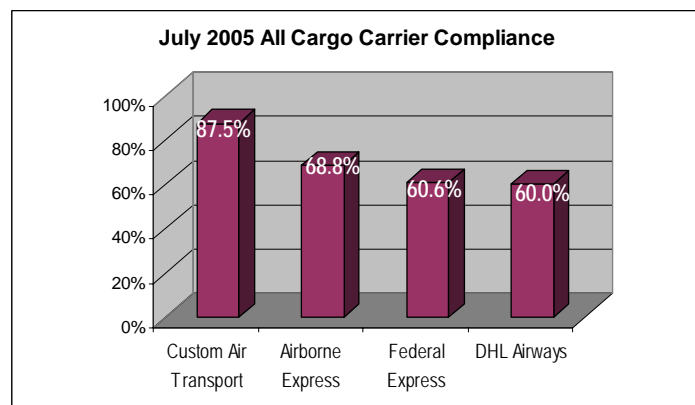


### Top Airlines

Among the carriers with over 10 departures to the east during the month of July 2005, 4 had 70% or more of their aircraft stay within the Tempe Corridor. Last month 5 airlines had from 70% to 90% of their aircraft comply with the Tempe Corridor

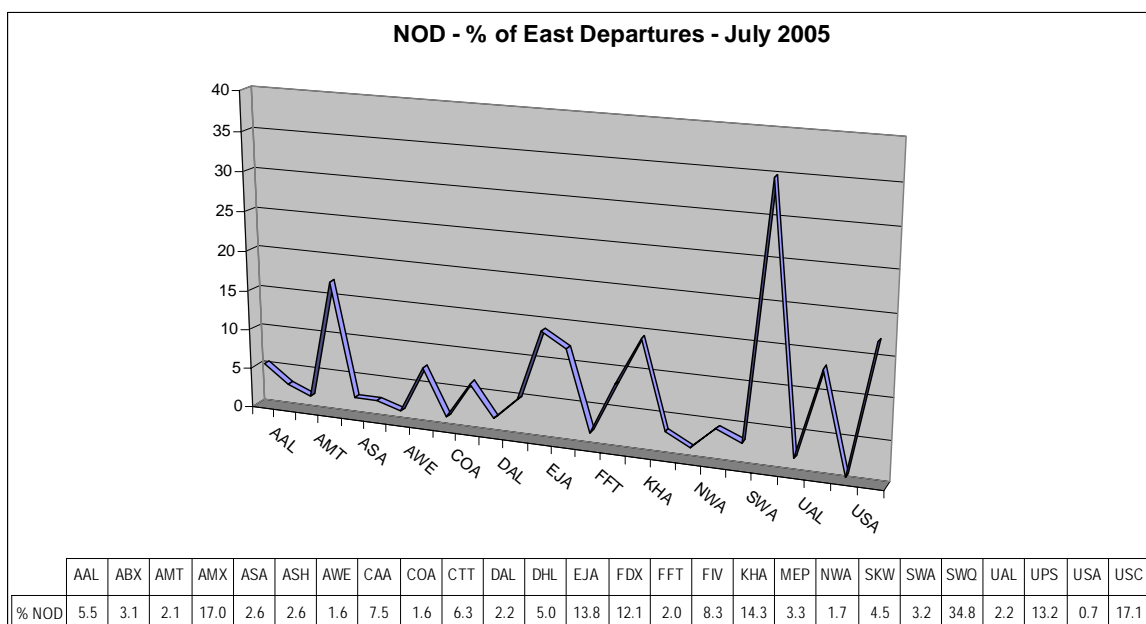


The compliance rates for the top cargo carriers with more than 10 departures to the east during the month of July 2005 improved from last month when the top 3 all cargo carriers had between 40% and 61% of their aircraft in compliance with the Tempe Corridor.



### Notice of Deviation

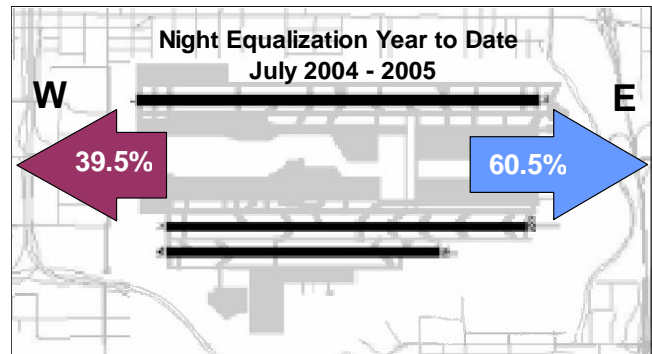
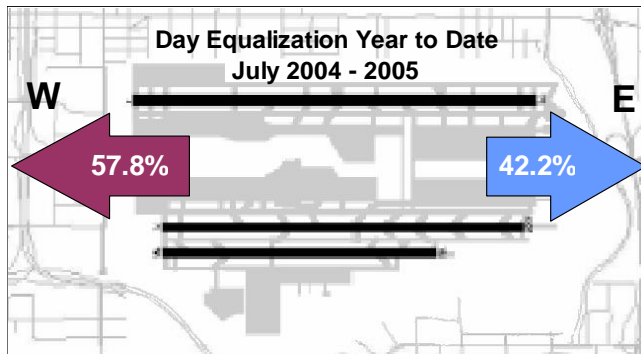
The City of Phoenix issues Notice of Deviation (NOD) to airlines and operators of smaller jet aircraft if any of their jets fails to comply with the 4DME Gate. Among the operators of jets with at least 5 departures to the east during the month of July 2005 Swift Air and US Check Airlines received the most notices relative to the number of east departures registered for each operator.





## 4. East/West Departure Split

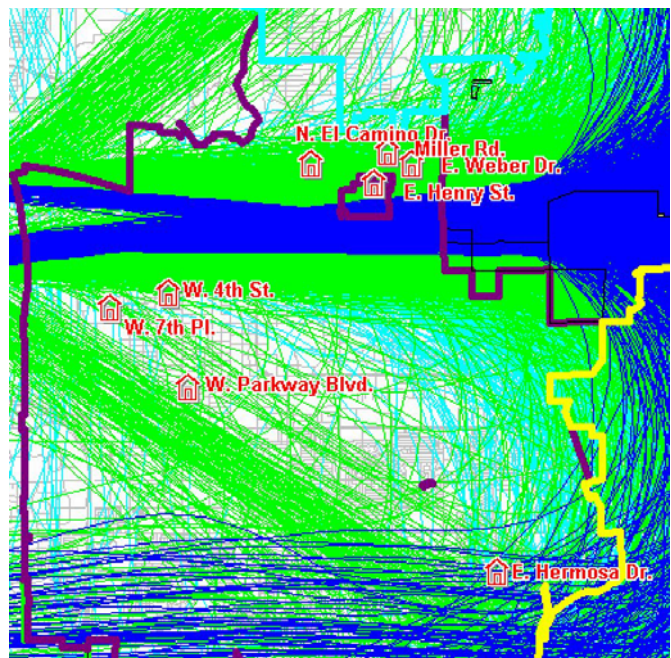
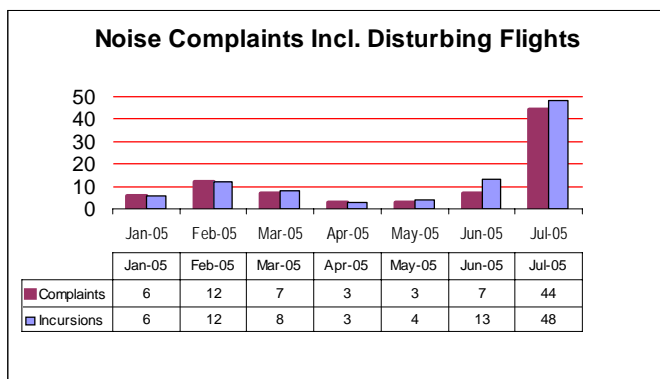
The split in jet and large commuter aircraft departures to the east and west of the Phoenix Sky Harbor International Airport is generally not as favorable for Tempe during the nighttime hours compared to daytime hours. As of July 2005 60.5% of all nighttime and 42.2% of all daytime departures by jet and large turboprop aircraft have gone towards the east since July 2004.



Day and nighttime departures are generated by a query covering day + evening hours and nighttime hours. Day = 7: 00 a.m. to 9:59:59 p.m. local time and Night = 9:59:59 p.m. to 7:00 a.m.

## 5. Complaints

The City of Tempe started registering aircraft noise complaints from Tempe residents in October 2000 after the opening of the third runway at Phoenix Sky Harbor International Airport. During July 2005, 8 residents filed 44 noise complaints with the City of Tempe. Complaints on the high frequency of commercial jets departing Sky Harbor during early morning hours, with planes in rows diverting over areas where residents report they are not used to this amount of air traffic. Noise from planes at nights reported to be particularly annoying.



Green flight tracks = Departures outside the Tempe Corridor  
 Blue flight tracks = Departures inside the Tempe Corridor  
 Turquoise flight tracks = Arrivals  
 Address of resident that filed complaints =



## **6. The Sky Harbor airport conducts noise briefings with FAA controllers**

At the May 2005 TAVCO meeting the airport informed the members about periodic briefings given to the FAA air traffic controllers about noise mitigation procedures at Sky Harbor, with particular focus on how noise officials at Sky Harbor want controllers to handle requests from pilots for direct-to routing when they depart the airport during nighttime hours between 10:00 p.m. and 6:00 a.m. The Phoenix officials want controllers to keep pilots to the published procedures until the aircraft reach higher altitudes, and not give clearances that enable pilots to go on directs to intercept the route destination course when traffic is sparse. Direct-to routing of aircraft saves aircraft operators time and fuel, but exacerbates the noise impact by bring departing aircraft over a larger area, see p. 3 about the Tempe Corridor. At the August TAVCO meeting the airport reported that the annual noise briefing of PHX TRACON controllers was completed and PHX tower controllers were scheduled to get their briefing before the end of August 2005.

## **7. TAVCO Recommendations followed up in City's response to the Sky Harbor DEIS**

August 9, 2005 the City of Tempe submitted a letter to the FAA with extensive comments on the Draft Environmental Impact Statement (DEIS) for construction projects at the Phoenix Sky Harbor International Airport. The City included in the letter elements recommended by TAVCO. The Commission held a special meeting on June 28, 2005 to discuss the DEIS and a recommendation to the Mayor and City Council. At this meeting the members received input from Tempe residents on issues related to impacts from Sky Harbor operations and the continued expansion of the airport to accommodate future growth.

TAVCO recommended that the City should:

- Make a formal request to the FAA that the comment period for the Sky Harbor DEIS be extended.
- Direct staff to review the DEIS in detail as it relates to impact that the proposed West Terminal and other projects may have on the citizens of Tempe.
- Include a review of how the proposed projects in the DEIS relate to carrier-based aviation now and in the future for Maricopa County and the surrounding counties and communities.
- Include comments about the DEIS being too narrow in terms of assessing aircraft operations, future growth, noise and other alternatives.

July 26, 2005 the FAA extended the public comment period to August 10, 2005 upon a request made by the City of Tempe of July 12, 2005.